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## Plough in

### When is it used and what are the benefits?

Plough in is used in open field areas and eliminates the need for open trench construction and the consequential disruption to surrounding activities. The pipe is fed in as the installation device traverses the proposed course.

### What are the concerns?

With plough in, the main concern is contact between the pipe and rocks contained within the native soil. This contact can result in point loading and gouging of the pipe. Consequently, a high degree of confidence in the native soil condition is normally required. In addition, there is no way of assessing the extent of surface damage to the pipe once installed. As tensile load or pressure related hoop stress is applied, surface damage may put the pipe at risk. Areas of pipe surface damage results in localised areas of stress concentration that may lead to eventual failure arising from slow crack growth.

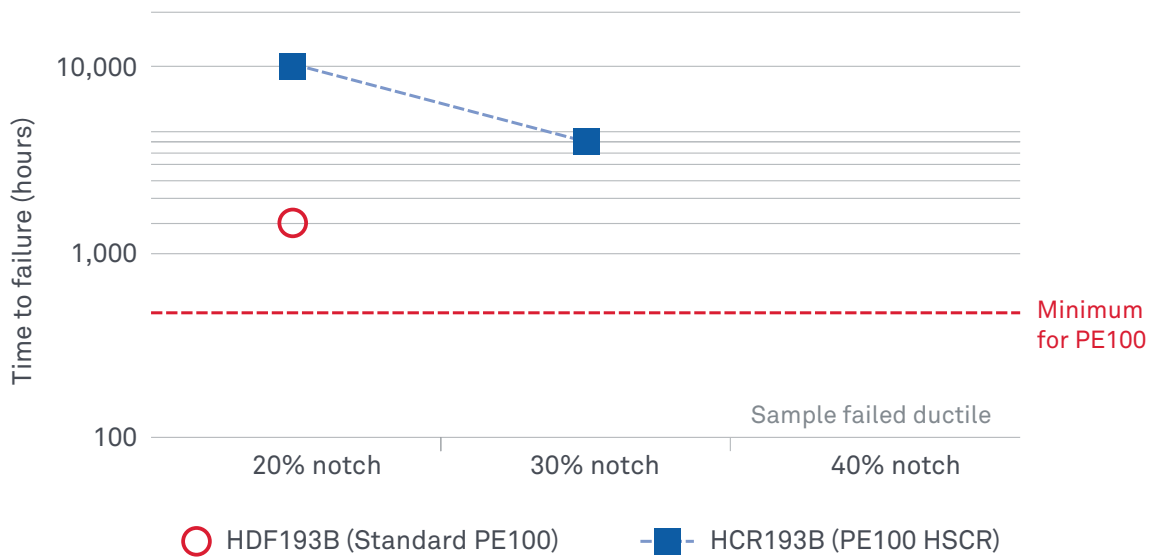
### How can the use of Alkadyne® HCR193B address these concerns?

Alkadyne® HCR193B is a PE100 HSCR resin that has been specifically developed to achieve stress crack resistance that is greatly superior to standard PE100 resins. Alkadyne® HCR193B complies with AS/NZS 4131 and meets the requirements of POP016 for High Stress Crack Resistant PE100. The use of Alkadyne® HCR193B inhibits crack growth from notch type damage during installation and point loading due to rock and root impingement.

Surface damage is a significant risk when installing pipe using the plough in method. The depth of any surface damage on the installed pipe cannot usually be accurately determined in the field, and may possibly be greater than the 10% of the wall thickness that is allowed by the installation standard. Testing has shown that Alkadyne® HCR193B meets slow crack growth resistance specifications even with notches deeper than 10% of the wall thickness as shown in the chart below.

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### Notched Pipe Test (ISO 13479)



NOTE: Test covered 110mm pipes with varied notch depth tested in hydrostatic pressure test at 920kPa/80°C

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**Figure10:** Notched Pipe Test ISO 13479 with varying notch depth

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